



# Community Update

## Durham Meadows Superfund Site

Durham, Connecticut  
June, 2004

United States Environmental  
Protection Agency - New England

1 Congress Street, Suite 1100  
Boston, MA 02114-2023

## 1,4 - Dioxane

*The U.S. Environmental Protection Agency (EPA), in conjunction with the Connecticut Department of Environmental Protection (CT DEP) and the Connecticut Department of Public Health (CT DPH), sampled a limited number of residential drinking water wells in Durham during December 2003, January 2004, and April 2004. Sampling results indicated the presence of a newly identified contaminant, 1,4-Dioxane, in some of the wells. EPA and CT DEP will be sampling a larger number of wells in the area the weeks of June 7 and June 14, 2004 in order to more fully characterize the detections of 1,4-Dioxane at the Durham Meadows Superfund site. The agencies plan to sample up to 80 locations, including wells that were already sampled in recent efforts. This fact sheet is designed to provide basic information about 1,4-Dioxane.*

### **What is 1,4-Dioxane?**

1,4-Dioxane is a compound which is used both as a solvent, and as a stabilizer for other chlorinated solvents such as 1,1,1-trichloroethane (TCA) that are used in industrial degreasing operations. It is also present in a variety of paint products, automotive coolant liquid, and many commercial cosmetics and toiletries. [1,4-Dioxane is not the same as "dioxin," which is a different type of contaminant.] The ability to detect low concentrations of 1,4-Dioxane has only recently become available. EPA and CT DEP had not sampled for this compound in residential wells in Durham, CT until this recent effort.

### **What happens to 1,4-Dioxane when it enters the environment?**

1,4-Dioxane is known to migrate rapidly in the environment and mix easily with water. Since it does not bind well to soil, 1,4-Dioxane can move through the ground and enter groundwater. It does not readily evaporate from water or moist soil into the ambient air due in part to its low vapor pressure. Plants and animals are not likely to store 1,4-Dioxane and so there is little concern for exposure via homegrown food supplies.

### **How might I be exposed to 1,4-Dioxane?**

If your drinking water is contaminated with 1,4-Dioxane, your most likely exposure route would be water ingestion. Smaller amounts of exposure may occur from dermal contact while bathing and from inhalation of 1,4-Dioxane that evaporated from the water. 1,4-Dioxane is known to be present in some industrial and commercial products such as shampoos, liquid soaps or lotions, pesticides, and as an unintentional food additive in some food packaging adhesives.

### **How can 1,4-Dioxane enter and leave my body?**

Uptake into the body: 1,4-Dioxane can be absorbed into the body following ingestion (via eating or drinking), inhalation (via breathing) and dermal exposures (across the skin).

Elimination from the body: 1,4-Dioxane is eliminated from the body mainly in the urine, both as 1,4-Dioxane itself and as breakdown products. Some also leaves through exhaled breath.

Bioconcentration potential: There is no evidence

that 1,4-Dioxane bioconcentrates in the body.

### ***How can 1,4-Dioxane affect my health and the environment?***

Effects of 1,4-Dioxane on human health depend largely on how much of the chemical is present and absorbed into the body and on the duration and frequency of exposure. Effects also depend on the health of a person. EPA has classified 1,4-Dioxane as a Probable Human Carcinogen, based on sufficient animal carcinogenicity data. Repeated drinking water exposures to very high levels of 1,4-Dioxane in animals for a significant portion of their life span have caused increased mortality, and caused kidney and liver damage and liver tumors. There is very little information on the potential for 1,4-Dioxane to cause cancer in humans.

Based on the levels of 1,4-Dioxane found to date at the Durham Meadows Superfund site, the agencies believe that the only exposure pathway that bears further investigation at this time is ingestion of drinking water.

### ***What levels have been detected in drinking water wells in Durham?***

The wells at which 1,4-Dioxane was detected in December 2003, January 2004, and April 2004 are all currently being filtered and monitored under State order for other contaminants, volatile organic compounds (VOCs, or solvents). 1,4-Dioxane was detected in untreated water, partially filtered water (between the two filters), and in some cases, in fully treated water (tap water). The highest level of 1,4-Dioxane found in untreated water at a residential well was 26 ppb (parts per billion). To date, the highest level of 1,4-Dioxane found in fully treated water at a residential well was 12 ppb.

### ***Is the water safe to drink?***

The Connecticut Department of Public Health (CT DPH) has determined that the current levels of 1,4-Dioxane in drinking water do not present a risk to public health. Additionally, EPA-New England has determined that the levels do not warrant immediate action at this time.

CT DPH was asked to make a potability determination for the wells containing 1,4-Dioxane at the Durham Meadows Superfund site. The CT

DPH review evaluated this chemical's toxic effects, exposure potential, and possible risks to the general population and vulnerable groups (e.g., pregnant women, young children). This evaluation derived an interim drinking water comparison value of 20 ppb, a level that is intended to protect against 1,4-Dioxane's cancer and non-cancer health effects. This means that CT DPH would recommend that residents drink bottled water if the post-filter water sample is above 20 ppb. Detections that are below 20 ppb may require additional monitoring.

Based on its review, CT DPH determined that the level of 20 ppb is likely to be many times below the 1,4-Dioxane exposure levels where effects in animals begin to occur. CT DPH believes the 20 ppb level provides a large safety margin given that 1,4-Dioxane is not a mutagen or able to damage DNA.

There is no federal drinking water standard for 1,4-Dioxane. EPA-New England currently uses a risk-based screening concentration of 6.1 ppb for 1,4-Dioxane in drinking water. Using this level for screening contaminants of potential concern is EPA's conservative approach and preference to account for the cumulative effect of multiple contaminants at the site. The fact that there are detections above EPA's screening level of 6.1 ppb indicate that follow-up monitoring is needed on a regular basis. EPA, CT DEP and CT DPH will closely monitor test results in light of current and future risk assessments on this chemical.

Another positive finding is that at all sampled locations, none of the other volatile organic compounds (VOCs) that have been historically found in this neighborhood in untreated water are making their way past the carbon filters into tap water. This indicates that the current system of filtration and monitoring is working to prevent public exposure to this group of VOCs.



## ***What happens next?***

EPA, in conjunction with CT DEP, will be sampling a larger number of wells in the area the weeks of June 7 and June 14, 2004 in order to more fully characterize the detections of 1,4-Dioxane at the Durham Meadows Superfund site. EPA and CT DEP will attempt to sample up to 80 locations, including wells that were already sampled in recent efforts.

CT DEP recently requested that the companies (Merriam Manufacturing Company and the Durham Manufacturing Company) add 1,4-Dioxane to the list of contaminants being sampled for those homes that are currently being filtered and monitored under State order for VOCs.

EPA, CT DEP and CT DPH will closely monitor all test results in light of current and future risk assessments on this chemical, and will recommend action as necessary, which may potentially include continued, regular monitoring for 1,4-Dioxane.

EPA recently determined that it was necessary to re-evaluate all available scientific information and studies regarding the potential toxicity of 1,4-Dioxane, because the information used to develop the screening level of 6.1 ppb is based on an older evaluation. The re-evaluation process is expected to be complete in 2006, and may result in a change to the 6.1 ppb screening concentration.

EPA will continue to evaluate the presence of 1,4-Dioxane and will continue to provide updated information about the ongoing evaluation.



## **SITE HISTORY AND BACKGROUND**

The Durham Meadows Superfund Site is located in the Town of Durham, Connecticut, and includes an area of groundwater contamination generally centered on Main Street. The Site is approximately 0.5 miles from the Coginchaug River to the west and borders Allyn Brook to the south. A fresh water wetland is within 1,500 feet of the site.

Investigation of the Site currently centers on the Durham Manufacturing Company and the former location of Merriam Manufacturing Company, both located on Main Street. Both companies manufacture metal cabinets, boxes and other items. The companies' past disposal of wastewater in lagoons or sludge drying beds (formerly accepted waste management practices), and inadequate drum storage at Merriam Manufacturing Company, contributed to the contamination.

In 1982, the Connecticut Department of Environmental Protection (CT DEP) detected volatile organic compounds (VOCs - commonly found in solvents, paints and degreasers) in private drinking water wells in the Durham area. Subsequently, limited soil cleanup activities were undertaken at both plant sites, however, the VOCs had already penetrated the bedrock aquifer, the source of domestic well water. Under a CT DEP order, Merriam Manufacturing and Durham Manufacturing installed carbon filters on impacted residential wells.

Currently, all impacted wells are fitted with two carbon filters. The two companies are monitoring and maintaining 38 filtered wells on a quarterly basis. Merriam Manufacturing Company services 24 of these wells. The remaining 14 wells are maintained and monitored by Durham Manufacturing Company. Regional School District #13 is maintaining and monitoring filters at the Strong School at 191 Main Street in Durham. CT DEP also periodically samples drinking water wells beyond the contaminated groundwater zone.

EPA is conducting a Remedial Investigation and Feasibility Study (RI/FS) at the Durham Meadows Superfund site. During an RI/FS, EPA and the potentially responsible parties conduct a series of studies to evaluate conditions at the site, define problems, and compare alternative cleanup strategies. In 1997, Durham Manufacturing Company signed an administrative agreement with EPA to conduct RI/FS work. Durham Manufacturing Company has since performed sampling work at residential wells in the southern portion of the site and also performed field investigations on its own property. Since the Merriam Manufacturing Company and its president, Allan Adams, refused to enter into this agreement, EPA performed groundwater sampling and analysis work at residential wells in the



northern portion of the site in 1998.

In early summer 2003, EPA also conducted RI/FS work at the former location of the Merriam Manufacturing Company, including groundwater, soil and soil vapor sampling to more fully define the nature and extent of contamination on the property. Based on contamination detected in soil, EPA determined that the chain-link fence around the front portion of the property will remain in place for at least the duration of the RI/FS, and possibly until a cleanup remedy is implemented. Detected levels of contamination in multiple surface soil locations exceed EPA risk-based residential soil standards. While this property is not used for residential purposes, the neighboring residences are located very close to the property. When the fence is not in place, there are no controls to keep neighborhood children from trespassing on the property. Contaminants in some of these locations also exceed EPA's risk-based industrial soil standards. These exceedances may not cause any increased risk to the adult workers on site as it is assumed that exposure to surface soil in these areas is minimal during regular daily activities, and that workers do not disturb these soils as part of normal business operations.

EPA and CT DEP are currently discussing the need for additional work on the property based on these results. EPA will analyze and present cleanup plans for the site in the RI/FS after all data is collected and validated, including data from the upcoming 1,4-Dioxane sampling.



***If you have any questions about the Durham Meadows Superfund Site or would like more information, you may call or write:***

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**Information Repository:** Durham Public Library, 7 Maple Avenue, Durham, CT 06422-2112. For assistance locating information in the repository, please call Valerie Harrod at 860-349-9544. Library hours are 10:00 - 9:00 Monday - Thursday, and 10:00 - 5:00 Friday and

**EPA New England website for Durham Meadows**  
**[www.epa.gov/ne/superfund/sites/durham](http://www.epa.gov/ne/superfund/sites/durham)**